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WHAT IS CLAIMED IS:

1.   A method of measuring and analyzing packet-
switched traffic in a packet-switched radio telecom-
munication network having a mobile station linked to a base
station through a radio channel, the base station being
linked to a radio access network, and the radio access
network being linked to a support node in a packet core
network, said method comprising the steps of:
        obtaining cell-level location information of the mobile
station in a node in the radio access network;
        adding the obtained cell-level location information to
user-plane packet headers;
        transmitting the user-plane packets carrying the cell-
level location information towards the packet core network;
        measuring the cell-level location information, user data
traffic, and the PDP context information at the packet core
network level; and
        analyzing the cell-level location information, user data
traffic, and PDP context information measured at the packet
core network level.

2.   The method of claim 1, wherein the step of
measuring the cell-level location information includes
measuring cell-level location information, user data
traffic, and PDP context information in a plurality of radio
access networks.

3.   The method of claim 2, wherein the step of
measuring the cell-level location information and the PDP
context information at the packet core network level
includes measuring the cell-level location information and

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the PDP context information at an aggregation level at which user-plane traffic from the entire network is combined.

4. The method of claim 1, wherein the step of adding the obtained cell-level location information to user-plane packet headers includes adding the cell-level location information only when the radio access network detects that the mobile station is performing a handover.

5. The method of claim 4, wherein the handover is a hard handover, and the cell-level location information includes an identity of a new cell where the mobile station is located.

6. The method of claim 4, wherein the handover is a soft handover, and the cell-level location information includes an identification of the cells in a new active set of cells.

7. The method of claim 4, wherein the telecommunications network is a Universal Mobile Telecommunications System (UMTS) network.

8. The method of claim 4, wherein the steps of adding the obtained cell-level location information to user-plane packet headers, and transmitting the user-plane packets carrying the cell-level location information towards the packet core network are performed only when cell-level location information is being measured.

9. The method of claim 4, wherein the radio access network is a UMTS Terrestrial Radio Access Network (UTRAN), and the support node is a Serving GPRS Support Node (SGSN), and the step of measuring cell-level location information of the mobile station includes measuring the cell-level location information on an Iu interface link between the UTRAN and the SGSN.

10. The method of claim 9, wherein the step of measuring the cell-level location information and the PDP context information at the packet core network level includes measuring the cell-level location information and the PDP context information for the entire network on a Gn interface between the packet core network and a Gateway GPRS Support Node (GGSN).

11. The method of claim 10, wherein the step of adding the obtained cell-level location information to user-plane packet headers includes adding the obtained cell-level location information to a General Packet Radio Service (GPRS) Tunneling Protocol (GTP) extension header.

12. The method of claim 11, wherein the step of adding the obtained cell-level location information to a GTP extension header includes encrypting the cell-level location information.

13. A method of measuring and analyzing packet-switched traffic in a Universal Mobile Telecommunications System (UMTS) packet-switched radio telecommunication network having a plurality of mobile stations linked to a

plurality of base stations through a plurality of radio
channels, each of the base stations being linked to a UMTS
Terrestrial Radio Access Network (UTRAN), and a plurality of
UTRANs being linked via an Iu interface to a Serving General

5   Packet Radio Service (GPRS) Support Node (SGSN) in a packet
core network, said method comprising the steps of:
       obtaining cell-level location information of the mobile
station in the RNC and adding the cell-level location
information to headers of user-plane packets on the Iu

10   interface;measuring the cell-level location information of
the mobile stations on a plurality of Iu interface links
between the UTRANs and the SGSN;
       measuring packet data protocol (PDP) context information
on the Iu interface links between the UTRANs and the SGSN;

15   combining the cell-level location information and the
PDP context information from the plurality of Iu interface
links to obtain information for the entire network; and
       analyzing the cell-level location information and PDP
context information for the entire network.

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       14.   A method of measuring and analyzing packet-
switched traffic in a Universal Mobile Telecommunications
System (UMTS) packet-switched radio telecommunication
network having a plurality of mobile stations linked to a

25   plurality of base stations through a plurality of radio
channels, each of the base stations being linked to a UMTS
Terrestrial Radio Access Network (UTRAN), and a plurality of
UTRANs being linked to a Serving General Packet Radio
Service (GPRS) Support Node (SGSN) in a packet core network

30   through an Iu interface link, said packet core network being
linked to a Gateway GPRS Support Node (GGSN) through a Gn
interface link, said method comprising the steps of:

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      passing cell-level location information for the mobile stations and PDP context information from the plurality of UTRANs to the GGSN via the Iu interface links, the SGSN, the packet core network, and the Gn interface link;

5   measuring on the Gn interface link, user-plane traffic for the entire network, said user-plane traffic including cell-level location information for the mobile stations and PDP context information combined from the plurality of UTRANs; and

10   analyzing the cell-level location information and PDP context information for the entire network.

      15. A mobile telecommunication network for exchanging data packets, said telecommunication network including an

15   access network portion for connecting a plurality of mobile stations to the telecommunication network, a packet core network portion for connecting the access network portion to external networks, and at least one network monitoring device, said telecommunication network characterized by:

20   the access network portion including nodes for transmitting data packets from the mobile stations towards the packet core network portion, wherein at least one of said nodes adds cell-level location information to the data packets that are transmitted towards the packet core network

25   portion; and

      the monitoring device being placed at a point in the telecommunication network where the monitoring device measures cell-level location information aggregated from a plurality of nodes.

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16.   The mobile telecommunication network of claim 15, wherein the mobile telecommunications network is a Universal Mobile Telecommunication System (UMTS) network.

5   17.   A monitoring device for measuring and analyzing packet-switched traffic in a packet-switched radio telecommunication network having a plurality of mobile stations linked to a plurality of base stations through a plurality of radio channels, each the base station being linked to a
10   radio access network, and a plurality of radio access networks being linked to a support node in a packet core network, said monitoring device comprising:
        at least one measurement point for measuring cell-level location information of the mobile stations at a level in
15   the network where the cell-level location information of a plurality of mobile stations is aggregated; and
        computing means for analyzing the measured aggregated cell-level location information.

20   18.   The monitoring device of claim 17, further comprising means for obtaining packet data protocol (PDP) context information for the packet switched traffic, wherein the computing means includes means for analyzing the PDP context information together with the measured cell-level
25   location information for the entire network.